which the leafy vegetable (2)phag (2)ka-(2)cheed is one, and digging a deep hole at its entry. At the proper time the opening was plugged. The fish grew in the pool and were taken as needed, sometimes, for convenience, several at a time, to be kept alive in a large pot near the house. By draining the pond fish were "harvested" (p. 12). Yields varied, but villagers had the impression that they had declined considerably over a period of years.[1] In 1952, at the suggestion of FAO, the Thai government tried to increase the supply by introducing tilapia culture. During the first three years of the experiment about one-third of the families in Bang Chan had tried to raise tilapia, but in the summer of 1957 members of the research group were told that no one had persisted (see Appendix A, p. 101).

Eggs. - Chickens were raised by about 90% of the families in Bang Chan, and over 70% owned 10 or more. In contrast, only 37% of the households had ducks, and only 13% had 10 or more (Goldsen and Ralis, 1957, p. 56). Ducks were regarded as trouble makers. Moreover, chickens could feed "naturally" and certainly helped themselves to paddy from the bin, whereas ducks did not eat paddy, but had to be provided with bran and broken rice.

Most of the eggs produced were sold. Janlekha (1955) estimated the annual production of chicken eggs in Bang Chan as 366,540, and that of duck eggs as 268,200 eggs. According to the information which Janlekha obtained from 106 households in 1953, about 4/5 of the chicken eggs were sold as a secondary source of farm income whereas more than 3/4 of the duck eggs were home consumed. Slightly over 2/5 of all eggs produced in the village were consumed there. On a per capita basis, the average annual consumption of 708 eggs for an average family size of 5.7 persons (Janlekha, 1955) amounted to a little over 1/3 of an egg per day. Home consumption of eggs might be less in households in which enough chickens were raised to make regular sale of eggs possible. Thus in 5 of the 31 households studied by Sharp et al. (1953, p. 197) all hen's eggs produced were consumed at home.[2] For these families, an average of 452 eggs per family per year or about 1-1/4 egg per family per day, were thus available. Home consumption in the 26 families which sold eggs amounted to an average of 215 per year or about 0.6 egg per family per day. One informant commented that a rich man could eat an egg every day, but she could not afford to do so. She said she sold eggs, when she had them, and bought foods to eat with rice.

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1. Sharp et al., 1953, pp. 191-192.

2. This probably means that eggs were not sold in quantity, not that none were used in barter (cf p. 5); thus the number of eggs available may be overestimated.

511 appeared to account in large part for the greater cash expenditures of some families than others. Thus Household 25, with the highest total and per capita cash expenditure for food among these 11 families, consumed a larger quantity of meat than others, and often bought beef, which was the most expensive item purchased. This household bought fruit, meat, and vegetables from venders almost every day. They said [554] [822] "Some do not pay money to buy food, but pick or get it from the canal or gardens —this family cannot live like that because they come from a rich family and cannot live on poor food, so most of the money goes for food." The husband said "I cannot work on poor food." In Group A, Household 12, which had the highest per capita food expenditure, had little home produced food. The wife, who went to Bangkok often, usually bought food when in town. Household 2, with a total cash expenditure for food higher than others, did not have pork or beef on survey days, but ate more (1)plaa (1)thuu, a sea fish which is purchased.

433 511 Home Production of Food. - In keeping with the general pattern in the community, the families surveyed produced most of their own food.

243 [461] 256 [262] Rice. - The hired laborer received rice as part of his pay, but all other families produced their own. Seven households used polished rice exclusively (Table 9). The only one to use home pounded rice in major part was Household 103. This family lived near a little canal which was dry in summer, so they were using home pounded rice when visited toward the end of March and in mid-July (Rounds IV and I). When the observer came in January (Round III), transportation of rice to the mill by boat was possible, but the family members had little farm work to do and were willing to spend some time milling rice. This family, which lived in the home-milling area (see p. 40), took rice to be milled only during the harvest season when they were busy, and the level of the canal was still high. The families which used home pounded rice in minor part did not live in the home-milling area, and apparently milled rice at home only when they were unable to get to the mill by boat.

244 [554] [245] Fruits and vegetables. - Although the Thai government has attempted to encourage kitchen gardening, few vegetables and fruits were produced by the families which cooperated in the dietary study (Table 10). All families grew bananas, and certain common ingredients of curries: chilies, bergamot, galangal and lemongrass. No other plants were grown by as many as half of the families studied.

222 262 Of the edible plants which grew wild, swamp cabbage was used by 7 families on 11 of the 44 survey days. Bamboo shoots, the white flowers of the West Indian pea tree and yellow (2)sa-(5)noo flowers were used by 3 families on one day each;

Notes on Tilapia Culture in Bang Chan

228 654 In 1952, the Thai government, at the suggestion of FAO, began to encourage tilapia culture. Fingerlings and some information on tilapia culture could be obtained from the Minburi district office, where a demonstration pond was maintained. Early in 1953, we learned from the records of the district officer that three persons in Bang Chan, two of them hamlet headmen, had obtained tilapia from this source. In 1953 the commune chief called a meeting in the village and explained the importance of tilapia raising. In May 1955 when Ralis conducted a survey in Bang Chan (Goldsen and Ralis, 1957), tilapia raising had been tried in nearly a third (31%) of the households, but was considered by 2/3 of the respondents to pay little.

The authors comment:

> From discussions with the people it appears that they are learning by trial and error to raise tilapia. Though fish culture is, for them, mainly a sideline activity, nevertheless, it requires the building of a special dam, care in preventing other fish from devouring young tilapia and maintaining the appropriate balance of fresh water in a given pool. The loss resulting from the fish dying or being eaten by others is relatively high. Although tilapia multiply rapidly, the cash return is not as great as that realized from mushroom growing. The cycle of raising tilapia lasts about four months. [434]

From the comments just quoted, tilapia culture appears to have been undertaken for the anticipated cash return. No information was obtained by Ralis concerning the extent to which the villagers used tilapia to increase their supply of fish for home use. In the summer of 1957 members of the research group who visited Bang Chan found that no one was raising tilapia; they were neither a source of food nor of cash. Some indication was obtained that their flavor and texture were not agreeable. Clearly the attempt to introduce a rapidly growing but unfamiliar variety of fish failed in Bang Chan. An understanding of the reasons for this failure might help to prevent other costly failures in future. [114]

Notes on Mushroom Culture in Bang Chan

177 244 Goldsen and Ralis (1957) commented as follows:

> Three years ago the commercial growing of mushrooms in Bang Chan was unknown. By 1955, the practice of growing mushrooms had reached into many homes (44 per

7: Janlekha X-4,5 (1948-1953)1956 AO7 Central Thai AO7
Bangchan

178 survey in 1948, the "negligible amounts" comes from daily
226 talk with Bangchan residents). Third, several informants
433 testified that the amount of fish caught from the same pool
[262] by the draining method had been decreasing each year. One of these gave the following comparative figures for fish caught from the same pool on April 8 - 10, 1953 and on approximately the same time of the year in 1952 as follows:

Kind of Fish	Number Caught in 1953	Number Caught in 1952
Pla Salid	400	800
Pla Salad	100	200
Pla Kasong	50	120
Pla Chado	6	15
Pla Krai	1	--
Pla Doog	50	50
Pla Mor	20	25
Pla Chorn	150	300
Large turtle	5	3
Small turtle	7	3
Eel	5	5

Others also gave the 1953 figures, but could not itemize the 1952 figures; they only said that they "got much more than this year."

226 There had been until 1952 no positive program for
654 fish conservation; only negative measures have been taken, such as the Ministry of Agriculture's ordinance against fishing by certain methods at certain times of the year. In 1952, however, the Government began an extensive program of introducing a new variety of fish, Pla Mor Thed, into rural areas of Thailand. This new variety has been claimed to grow faster than the native varieties. While this program cannot as yet be appraised, a point of observation may be

226 made that any program of fish raising in a closed pond, no
654 matter how effective it may be, should not preclude the need for conservation of fish naturally existing in the open canals.

243 It has been pointed out that Bangchan operators
226 produce 52 per cent of the things they need for ordinary
433 consumption. Thus, rice growing may be seen as a farming-
434 to-reduce-cost enterprise where maximization of profit ceases to be the primary motive of production. It has been pointed out also that rice growing is a losing concern to many operators (in terms of labor income and operator's labor earnings), but the loss has been compensated by the privilege to fish
[146] which is open to all village residents. Since the amount of fish caught constitutes the main and probably the only source of protein intake and at the same time a considerable share in the diet of villagers, continually decreasing supply of fish therefore underscores the immediate need for an effective program for fish conservation as a means to prevent the standard of living of the villagers from falling below the minimum level of subsistence.

161 Over-population in an area of limited job opportuni-
464 ties naturally creates an over supply of labor, which in
465 turn results in low wages. This is further complicated by a wide variation of individual earnings from labor of from two thousand baht annually to almost nothing, the latter being the case of transient members of farm operating families.

7: Janlekha X-4,5 (1948-1953)1956 AO7 Central Thai AO7
Bangchan

243 reduction in crop failures, and the improved quality of
312 rice, irrigation would also enable each family to cultivate a larger amount of land. The farmer could regulate the softening and flooding of his fields and thereby increase the number of days available for cultivation of rice. Without irrigation the work load was dictated by the rains.
[654] This over-all scheme was rejected by the government. Instead, a scheme drawn twelve years later by Sir Thomas Ward, a British irrigation expert, calling for separate small projects was adopted in 1916. Since the main source of water -- that from the Chao Phya River -- was not utilized by this latter scheme, the problem of scarcity of water in the early period of rice season has not been solved. Commenting on this point, Ingram wrote in 1955: "It is perfectly clear that if Van der Heide's irrigation schemes had been pushed forward rapidly, using foreign capital when necessary and domestic revenue where possible, the investment would have proved a sound one for the nation. The crop failure of 1919-20 alone cost the nation more than the entire
[654] cost of the works."[2] With loan from the International Bank for Reconstruction and Development, the government is now undertaking the Chainat Project which includes construction of a barrage across the Chao Phya River as envisaged by Van der Heide half a century ago.

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2. Ingram, op. cit., p. 87.